

Fundamentals of Agriculture

Fundamentals of Agriculture is designed to develop the basic theories and principles involved in animal science, agribusiness, agricultural mechanics, and natural resource management. The standards prepare students to choose among agricultural careers for the 21st century.

Pre-requisites: **None**

Recommended Credits: 1

Recommended Grade Level: 9th

Note: It was the consensus of both the industry representatives and the teachers that a student who receives credit in Fundamentals of Agriculture should not be awarded credit in Agriscience, and a student who receives credit in Agriscience should not be awarded credit in Fundamentals of Agriculture.

*** All learning expectations must be met for the 1 credit in this course.**

Fundamentals of Agriculture

Standard 1.0

The student will evaluate the theories of animal science as they pertain to the following areas: animal's role in the ecology, animal anatomy and taxonomy, nutrition, facilities, basic genetics and reproduction and identification and functions of basic livestock breeds.

Standard 2.0

The student will summarize the basic principles involved in agribusiness including recordkeeping, leadership, principles of supply and demand and associated agribusiness careers.

Standard 3.0

The student will investigate the principles involved in soil structure and formation, plant taxonomy, soil conservation and water quality, soil and plant relationships and ecology.

Standard 4.0

The student will utilize mathematical computations and agricultural lab equipment for basic agricultural construction.

Standard 5.0

The student will demonstrate academic integration in Fundamentals of Agriculture.

Standard 6.0

The student will develop premier leadership and personal growth in the area of Fundamentals of Agriculture.

Fundamentals of Agriculture

Course Description:

This course is designed to develop the basic theories and principles involved in animal science, agribusiness, agricultural mechanics, and natural resource management.

Standard 1.0

The student will evaluate the theories of animal science as they pertain to the following areas: animal's role in the ecology, animal anatomy and taxonomy, nutrition, facilities, basic genetics and reproduction and identification and functions of basic livestock breeds.

Learning Expectations:

The student will:

- 1.1 Analyze the basic role of animals in the environment.
- 1.2 Examine the concepts of basic animal anatomy and taxonomy including life's basic unit (cell) and the functions of the organ systems.
- 1.3 Describe the classes of feed needed by animals.
- 1.4 Determine the importance of waste management.
- 1.5 Summarize the basic principles involved in reproduction and genetics.
- 1.6 Discuss the types of disease and parasites involved in herd health.
- 1.7 Recognize and describe the functions of the basic breeds of livestock.

Evidence the Standard is Met:

The student will:

- Examine the interactions of animals and their environment.
- Diagram basic animal anatomy and systems and discuss the functions of each part.
- Describe the importance of the different classes of feeds.
- Describe the impact animal wastes can have on the environment.
- Develop an understanding of the principles and theories involved in basic genetics and breeding.
- Specify the common diseases and parasites involved in herd health.
- Describe the functions of the common breeds of livestock.

Integration/Linkages

Science, Ecology, Chemistry, Biology, Language Arts, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Standards

Sample Performance Tasks

- Summarize the role of animals in the environment.
- Evaluate the different classes of feed.
- Detect ways animal wastes can impact the local environment.
- Summarize different methods of sexual reproduction.
- Classify livestock diseases and parasites that are founded locally.
- Create a portfolio of livestock that identifies different breeds and their uses.

Standard 2.0

The student will summarize the basic principles involved in agribusiness including recordkeeping, leadership, principles of supply and demand and associated agribusiness careers.

Learning Expectations:

The student will:

- 2.1 Illustrate the basic principles of supply and demand and their relationship to production.
- 2.2 Summarize the basic principles involved in financial recordkeeping and accounting.
- 2.3 Evaluate career opportunities in agriculture.
- 2.4 Analyze the principles involved in reading a financial statement and planning a budget.
- 2.5 Summarize the terminology that is associated with business.
- 2.6 Utilize the principles involved in problem solving.
- 2.7 Determine the roles of oral and written communication in agribusiness.
- 2.8 Describe ways basic parliamentary law is used in business.

Evidence Standard is Met:

The student will:

- Debate the principles of supply and demand and their relationship to productivity.
- Utilize principles and procedures involved in financial recordkeeping and accounting.
- Using trade journals and the Internet, prepare a portfolio of different careers in agriculture.
- Diagram the parts of a financial statement and the methods used in planning a budget.
- Summarize different methods for solving problems related to agribusiness.
- Demonstrate the proper use of oral and written communication.
- Discuss uses of parliamentary procedure in business.

Integration/Linkages

Mathematics, Economics, Accounting, Keyboarding, Language Arts, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Standards

Sample Performance Task

- Outline principles of supply and demand.
- Prepare a sample record book.
- Compare different local agribusiness industries.
- Prepare a sample budget from a financial statement.
- Propose different business problems and methods used in solving them.
- Prepare and present a two-to-four-minute speech on the importance of good business management.
- Demonstrate eight different parliamentary procedure abilities.

Standard 3.0

The student will investigate the principles involved in soil structure and formation, plant taxonomy, soil conservation and water quality, soil and plant relationships and ecology.

Learning Expectation:

The student will:

- 3.1 Examine the basic principles of soil texture, structure and formation.
- 3.2 Analyze the relationship between soil, plants and nutrients.
- 3.3 Evaluate the role of ecology in the environment.
- 3.4 Assess the importance of soil, water and air quality.
- 3.5 Outline the principles of seed germination.
- 3.6 Relate plant process to plant health and growth.
- 3.7 Differentiate between sexual and asexual reproduction.

Evidence Standard is Met

The student will:

- Demonstrate the principles of soil texture, structure and formation.
- Describe the relationship between soil, plants and nutrients.
- Diagram the relationship between living things in our environment.
- Relate principles of soil conservation and soil erosion to their effect on water quality standards.
- Demonstrate the relationship of plant functions and processes to plant production.
- Summarize the different ways agriculturists have plants reproduce.

Integration/Linkages

Chemistry, Biology, Ecology, Physics, Botany, Mathematics, Language Arts, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Standards

Sample Performance Tasks

- Using the touch and the ribbon methods, compare the three soil textures.
- Write a report on the impact of soil fertility and nutrients on plant growth rates.
- Recommend different methods of soil erosion control.
- Research examples of local point source pollution.
- Relate the different plant processes to their effect on plant performance.
- Diagram the parts of the plant and relate their functions to the different plant processes.
- Demonstrate the reproduction of plants sexually and asexually.

Standard 4.0

The student will utilize mathematical computations and agricultural lab equipment for basic agricultural construction.

Learning Expectations

The student will:

- 4.1 Apply general safety precautions involved in general shop work and tool use, metalworking and electricity.
- 4.2 Categorize common tools, give the application of each and describe its maintenance.
- 4.3 Evaluate the principles and theories involved in hot and cold metalwork including both arc and oxy-acetylene welding.
- 4.4 Examine the principles of electricity, including wiring, electrical properties, identification of electrical materials and tools.
- 4.5 Differentiate between 2-cycle and 4-cycle engines and their functions.
- 4.6 Outline principles and fundamentals of internal combustion engines.
- 4.7 Specify common building materials and estimate the cost of the materials.
- 4.8 Use the formula involved in figuring areas of different geometric figures.

Evidence Standard is Met

The student will:

- Recommend and demonstrate general safety precautions involved in shop work, tool usage, metalwork, and electricity.
- Determine uses of common fasteners.
- Demonstrate proper use of common hand and power tools.
- Demonstrate proper use of arc and oxy-acetylene welding equipment.
- Determine how to wire different electrical outlets, switches and junctions according to the properties of electricity.
- Compare the differences in combustion between a two-cycle and a four-cycle engine.
- Explain the principles of internal combustion engines.
- Estimate the amount of materials needed for a project and calculate the cost.
- Calculate the number of acres in a given amount of square footage.

Integration / Linkages

Physics, Mathematics, Chemistry, Ecology, Language Arts, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Standards

Sample Performance Tasks

- Write safety precautions for general shop work.
- Write safety precautions used in arc welding.
- Identify common nails.
- Square a board using a handsaw.
- Run a melting strip.
- Wire a single pole switch.
- Diagram the parts of a 2-cycle engine.
- Figure a bill of materials for a project.
- Figure the number of acres in a plot of land by pacing.

Standard 5.0

The student will demonstrate academic integration in Fundamentals of Agriculture.

Language Arts:

The student will:

- 5.1 Write a grammatically correct speech on the importance of agriculture in our society.
- 5.2 Browse and select research materials from the Internet on career opportunities in agriculture.
- 5.3 Write a report based on one of the first four standards in this course.

Mathematics:

The student will:

- 5.4 Calculate square footage.
- 5.5 Use proper formulas to calculate area.
- 5.6 Calculate acreage.
- 5.7 Use a measurement device to determine materials needed for a project.

- 5.8 Calculate cost per unit.
- 5.9 Convert Metric measurements to English.

Science:

The student will:

- 5.10 Differentiate plant parts.
- 5.11 Classify plants based on their taxonomy.
- 5.12 Differentiate organ systems of animals and give their functions.
- 5.13 Balance chemical equations.
- 5.14 Assess the effect of animals on the local ecology.
- 5.15 Analyze different types of pollution.
- 5.16 Assess the impact of ions on soil fertility.
- 5.17 Examine the effects of different types of bonding on soil chemistry.
- 5.18 Summarize the principles of elements as outlined on the periodic table.
- 5.19 Analyze the effects of agricultural pollution on the environment.

Evidence Standard is Met

The student will:

- Develop a presentation on the importance of agriculture to our society.
- Calculate the acreage in a plot of land.
- Calculate the materials needed and cost of a project.
- Present research on new technologies used in plant or animal science.

Integration/Linkages

Physics, Mathematics, Chemistry, Biology, Botany, Ecology, Language Arts, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Standards

Sample Performance Tasks

- Present a speech on the importance of science in agriculture.
- Balance chemical equations related to plant processes.
- Determine acreage of a plot of land by pacing the land.

Standard 6.0

The student will develop premier leadership and personal growth in the area of Fundamentals of Agriculture.

Learning Expectations:

The student will:

- 6.1 Demonstrate a positive work ethic and attitude.
- 6.2 Demonstrate proper time management skills.
- 6.3 Apply problem-solving skills.
- 6.4 Describe career plans that develop critical life-long thinking skills and allow for life long learning.
- 6.5 Demonstrate the ability to conduct a meeting in accordance with Robert's Rules of Order.

Evidence Standard is Met:

The student will:

- Prescribe the positive work ethics and attitudes needed in business.
- Demonstrate how proper planning can not only save on time, but also aid in solving problems.
- Develop a five-year plan for career goals, based on an SAEP, supervised agricultural experience program..
- Present oral reports related to the importance of agriculture in our society.

Integration / Linkages

Language Arts, Humanities, National FFA Guidelines for the Creed CDE, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Guidelines for SAEP

Sample Performance Task

- Recite FFA Creed.
- Conduct a mock business meeting, using three parliamentary procedure abilities.
- Deliver a two-to-three-minute presentation on the importance of leadership in agriculture.
- Prepare a five-year plan of action to reach personal goals.
- Develop an SAEP and complete appropriate record books.